EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	8407	acrylamide and foods and @ay<"2004"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 12:53
L2	116927	("426").CLAS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/11/14 12:53
L3	240	L1 and L2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 12:53
L4	240	L1 and L3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 13:25
L5	8694	(426/89,93-95,637,622,629,634,438, 439,302-303).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/11/14 13:34
L6	609	l5 and (fry or fried or frying) and flour and (legume or bean or lentil or peanut or soybean)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 13:36
L7	445	l5 and (fry or fried or frying) and flour and (legume or bean or lentil or peanut or soybean) and (coating or coat or dust or dusting or rolled)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 13:59
L8	391	l7 and @ay<"2004"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 13:55

EAST Search History

L9	42688	l7 and @ay<"2004" soybean adj oil	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 13:56
L10	203	l7 and @ay<"2004" not soybean adj oil	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 13:57
L11	174	l7 and @ay<"2004" not soybean adj oil not peanut adj oil	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 13:57
L12	174	l5 and (fry or fried or frying) and flour and (legume or bean or lentil or peanut or soybean) same (coating or coat or dust or dusting or rolled)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 14:00
L13	94	l5 and (fry or fried or frying) and flour and (legume or bean or lentil or peanut or soybean) same (coating or coat or dust or dusting or rolled) same (wheat or oat or barley or rye or rice or corn)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/14 14:00

CT AMIDES; AMINO ACIDS; CHIPS; FOOD SAFETY PLANT FOODS; FRUCTOSE; GLUCOSE; POTATOES; SUCROSE; ACRYLAMIDE; ASPARAGINE; FRENCH FRIES

L5 ANSWER 29 OF 35 FSTA COPYRIGHT 2006 IFIS on STN
AN 2004:J1913 FSTA
TI Development of high-performance liquid chromatography-electrospray mass spectrometry with size-exclusion chromatography for determination of acrylamide in fried foods.
AU Inoue, K.; Yoshimura, Y.; Nakazawa, H.
CS Correspondence (Reprint) address, Dep. of Analytical Chem., Fac. of Pharmaceutical Sci., Hoshi Univ., Shinagawa-ku, Tokyo 142-8501, Japan. E-mail nakazawa(a)hoshi.ac.jp
SO Journal of Liquid Chromatography & Related Technologies, (2003), 26 (12) 1877-1884, 10 ref.
ISSN: 1082-6076
DT Journal
LA English
AB An LC MS method with a size-exclusion chromatography column for the analysis of acrylamide in fried foods is reported. In MS analysis using an electrospray MS, the signal at m/z 72, which was assigned to the (M + H).sup.+ ion, was observed as the main peak. The main m/z signal was maximum at a fragmentor voltage of 100 V. The retention time for acrylamide elution from the size-exclusion chromatography column ranged from 15 to 20 min, and the eluate was analysed using LC MS with a reversed-phase column. A linear response was found for an acrylamide standard over the range 5.0-1000 ng/ml, with correlation coefficient (r) >0.99. Samples of potato chips and French fries were tested as purchased and after spiking with 100 or 2000 ppb acrylamide. Sample preparation was performed by means of solvent extraction, which gave acrylamide recoveries >90% with relative s.d. of <10%, with .sup.1.sup.3C-labelled acrylamide standards. As purchased, the acrylamide contents of potato chips were 1.5 ppm and those of French fries 200 ppb.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; CHIPS; FOOD SAFETY PLANT FOODS; HIGH PERFORMANCE LIQUID CHROMATOGRAPHY; MASS SPECTROSCOPY; POTATOES; ACRYLAMIDE; FRENCH FRIES; LC; MS; POTATO CHIPS

L5 ANSWER 30 OF 35 FSTA COPYRIGHT 2006 IFIS on STN
AN 2004:J0349 FSTA
TI French fries with less than 100 µg/kg acrylamide. A collaboration between cooks and analysts.
AU Grob, K.; Biedermann, M.; Biedermann-Brem, S.; Noti, A.; Imhof, D.; Amrein, T.; Pfefferle, A.; Bazzocco, D.
CS Official Food Control Authority of the Canton of Zurich, PO Box 8030, Zurich, Switzerland. Tel. +41 43 244 7131. Fax +41 43 244 7101. E-mail koni(a)grob.org
SO European Food Research and Technology, (2003), 217 (3) 185-194, 25 ref.
ISSN: 1438-2377
DT Journal
LA English
AB Preparation of French fries in oil and in ovens was studied and optimized to achieve optimum culinary quality with min. acrylamide content. French fries with 40-70 µg/kg acrylamide, 5-10x less than normal, were consistently produced by using potato cultivars with low levels of reducing sugars when raw, and avoiding storage temperature <10°C. The method involved soaking the potato after cutting in standing cold or boiler-warm water for approx. 15 min to extract asparagine and sugars from the surface without washing out starch. Pre-frying in oil (approx. 140°C for 2.5 min) inproved crispness. 100 g potato/l oil was then fried at an initial oil temperature of approx. 170°C. Acrylamide formation increased exponentially towards the end of the process, so to keep acrylamide contents low the proper end point of frying was determined. This was defined as the point when French fries were crispy with slight browning of

the tips to achieve the typical flavour, but no general browning. Preparation in the oven, starting from frozen prefabricates, required temperature of approx. 190 or 220°C, depending on whether or not air was circulated. Proper determination of the end point was again the most critical step.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; CHIPS; COOKING; FOOD SAFETY PLANT FOODS; POTATOES; SOAKING; STORAGE; TEMPERATURE; ACRYLAMIDE; CV; FRENCH FRIES; QUALITY; TEMP.

L5 ANSWER 31 OF 35 FSTA COPYRIGHT 2006 IFIS on STN
AN 2004:C0115 FSTA
TI Dietary intake of acrylamide in Sweden.
AU Svensson, K.; Abramsson, L.; Becker, W.; Glynn, A.; Hellenas, K. E.; Lind, Y.; Rosen, J.
CS Nat. Food Administration, Box 622, SE 751 26 Uppsala, Sweden. E-mail kesv(a)slv.se
SO Food and Chemical Toxicology, (2003), 41 (11) 1581-1586, 27 ref. ISSN: 0278-6915
DT Journal
LA English
AB Dietary acrylamide exposure in the Swedish population and foods containing high levels of acrylamide were investigated. 130 food samples collected from supermarkets in Uppsala, Sweden in spring 2002 were analysed for acrylamide by LC MS MS. Potato products processed at high temperature, e.g. potato crisps and French fries (average acrylamide concentration 1360 and 540 µg/kg, respectively), contained the highest levels of acrylamide, but other types of food also contained significant amounts, especially carbohydrate-rich products heated to high temperature (popcorn, bread and bakery products, cereal products and coffee). Fresh and boiled foods contained no quantifiable levels of acrylamide, and contents within food groups also varied. Population exposure to acrylamide was estimated using analytical results in combination with data obtained from the Swedish food consumption survey performed in 1997-1998. Average dietary acrylamide intake of adults in Sweden was estimated as approx. 31 µg/day, a level which is considered to be associated with potential health risks.
CC C (Hygiene and Toxicology)
CT AMIDES; DIET; FOOD SAFETY; ACRYLAMIDE; FOODS; SWEDEN

L5 ANSWER 32 OF 35 FSTA COPYRIGHT 2006 IFIS on STN
AN 2003:G0838 FSTA
TI A novel technique for limitation of acrylamide formation in fried and baked corn chips and in french fries.
AU Jung, M. Y.; Choi, D. S.; Ju, J. W.
CS Dep. of Food Sci. & Tech., Woosuk Univ., Samrea, Jeonbuk 565-701, Korea. E-mail munjung(a)woosuk.ac.kr
SO Journal of Food Science, (2003), 68 (4) 1287-1290, 6 ref. ISSN: 0022-1147
DT Journal
LA English
AB Effects of lowering pH using an acidulant (citric acid) on the formation of acrylamide in fried and baked corn chips and in french fries, were studied using GC-MS. Corn chips containing 0.1 or 0.2% citric acid were fried in corn oil at 180°C for 30 s, or baked in an oven at 255°C for 100s, whereas french fries were dipped in 1 or 2% citric acid for 1 h before frying in corn oil at 190°C for 6 min 30 s. 0.2% citric acid treatments inhibited acrylamide formation in fried and baked corn chips by 82.2 and 72.8%, respectively. Dipping french fries in 1 and 2% citric acid solutions for 1 h before frying inhibited acrylamide formation by 73.1 and 79.7%, respectively. A 99.1% inhibition of acrylamide formation was achieved when a 1 ml solution containing asparagine and glucose in phosphate buffer with the pH lowered from 7.0 to

4.0 was heated in an oven at 150°C for 30 min.
CC G (Catering, Speciality and Multicomponent Foods)
CT AMIDES; CHIPS; CITRIC ACID; CORN; FOOD SAFETY PLANT FOODS; FRYING; PH; POTATOES; ACRYLAMIDE; CORN CHIPS; FRENCH FRIES

L5 ANSWER 33 OF 35 FSTA COPYRIGHT 2006 IFIS on STN
AN 2003:G0376 FSTA
TI Analysis of acrylamide and mechanisms of its formation in deep-fried products.
AU Gertz, C.; Klostermann, S.
CS Chemisches Untersuchungsamt Hagen, Pappelstr. 1, 58099 Hagen, Germany. Tel. +49-2331-2074726. Fax +49-2331-2072454. E-mail gertz(a)cua-hagen.de
SO European Journal of Lipid Science and Technology, (2002), 104 (11) 762-771, 19 ref.
ISSN: 1438-7697
DT Journal
LA English
AB A reliable and sensitive GC-MS method was sought for the determination of acrylamide in fried food. The initial method yielded satisfactory results for repeatability and recovery; the limit of detection for acrylamide was 15 µg/kg food and recoveries were 95-103%. An improved method was then employed to study the influence of heat, heating time and type of frying oil on the formation of acrylamide during the deep frying of French fries. Acrylamide formation was promoted by heating in a time-dependent manner. It appeared that acrylamide arose when reducing sugars, dimethylpolysiloxane or partial glycerides were present. 3 mechanisms of acrylamide formation were seen. The mechanistic complexity increased dramatically in the presence of various food components and some recommendations are given to minimize acrylamide levels in deep fried products.
CC G (Catering, Speciality and Multicomponent Foods)
CT AMIDES; FOOD SAFETY; FRIED FOODS; GAS CHROMATOGRAPHY; HEATING; MASS SPECTROSCOPY; OILS; ACRYLAMIDE; FRYING OILS; GC; HEAT; MS

L5 ANSWER 34 OF 35 FSTA COPYRIGHT 2006 IFIS on STN
AN 2003:C0651 FSTA
TI The acrylamide storm.
AU Baigrie, B.
SO World of Food Ingredients, (2003), Feb., 37-40
ISSN: 1566-6611
DT Journal
LA English
AB Recent reports of high levels of acrylamide (a potential carcinogen) in bread, biscuits, cereal, potato chips and French fries, and work leading to an understanding of the formation of acrylamide during cooking are outlined. Asparagine has been identified as the amino acid from which acrylamide is formed, based on a series of Maillard reactions under `wet' conditions. Formation to a lesser extent under `dry' conditions, from asparagine and glucose, but also at trace levels from other amino acids (glutamine, aspartic acid, methionine), has also been simulated. Implications for the baking industry are discussed, particularly in terms of reformulating products. Other Maillard reactions in production of bakery products, which are significant for reasons unconnected to acrylamide formation, and are essential to aroma and appearance, are considered, as are the arguments surrounding the actual health risks associated with acrylamide ingestion.
CC C (Hygiene and Toxicology)
CT AMIDES; COOKING; FOOD SAFETY; ACRYLAMIDE

L5 ANSWER 35 OF 35 FSTA COPYRIGHT 2006 IFIS on STN
AN 2003:C0375 FSTA
TI Acrylamide in foods: occurrence, sources, and modeling.
AU Becalski, A.; Lau, B. P. Y.; Lewis, D.; Seaman, S. W.
CS Health Products & Food Branch, Food Res. Div., Health Canada, Address

Locator 2203D, Ottawa, Ont. K1A 0L2, Canada. Tel. (613) 941 8937. Fax (613) 941 4775. E-mail Adam_Becalski(a)hc-sc.gc.ca
SO Journal of Agricultural and Food Chemistry, (2003), 51 (3) 802-808, 18 ref.
ISSN: 0021-8561
DT Journal
LA English
AB Formation and sources of acrylamide in foods was investigated. Acrylamide levels were determined by LC-tandem MS (LC-MS/MS). Foods tested included commercially-available potato chips, potato fries, cereals and bread. Samples were homogenized with water/dichloromethane, centrifuged and filtered through a 5 kDa filter. The filtrate was cleaned up on mixed mode, anion and cation exchange (Oasis MAX and MCX) and C (Enviocarb) cartridges. Analysis was done by isotope dilution ((D.sub.3)- or (.sup.1.sup.3C.sub.3)acrylamide) electrospray LC-MS/MS using a 2 x 150 mm (or 2 x 100 mm) Thermo HyperCarb column eluted with 1mM ammonium formate in 15% (or 10% for the 2 x 100 mm column) methanol. 30 samples of foods were analysed. Concentration of acrylamide varied from 14 ng/g (bread) to 3700 ng/g (potato chips). Acrylamide was formed during model reactions involving heating of mixtures of amino acids and glucose in ratios similar to those found in potatoes. In model reactions between amino acids and glucose, asparagine was found to be the main precursor of acrylamide. Thus, in the reaction between N-15 (amido)-labelled asparagine and glucose, corresponding .sup.1.sup.5N-labelled acrylamide was formed. The yield of the model reaction was approx. 0.1%
CC C (Hygiene and Toxicology)
CT AMIDES; AMINO ACIDS; FOOD SAFETY; GLUCOSE; HIGH PERFORMANCE LIQUID CHROMATOGRAPHY; MASS SPECTROSCOPY; ACRYLAMIDE; FOODS; LIQUID CHROMATOGRAPHY; MODELLING; MS

=> s acrylamide and potatoes and fried
730 ACRYLAMIDE
13892 POTATOES
4597 FRIED
L6 39 ACRYLAMIDE AND POTATOES AND FRIED

=> s l6 not l5
L7 29 L6 NOT L5

=> d l7 all 1-29

L7 ANSWER 1 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2007:J0453 FSTA
TI Examination of conditions inhibiting the formation of acrylamide in the model system of fried potato.
AU Ishihara, K.; Matsunaga, A.; Nakamura, K.; Sakuma, K.; Koga, H.
CS Res. & Dev. Group, Calbee Foods Co. Ltd., 2-11-4 Yoshino-cho, Kita-ku, Saitama-shi, Saitama 331-0811, Japan. Fax +81-48-653-3033. E-mail k_ishihara(a)calbee.co.jp
SO Bioscience, Biotechnology, and Biochemistry, (2006), 70 (7) 1616-1621, 10 ref.
ISSN: 0916-8451
DT Journal
LA English
AB Acrylamide (AAm) is produced when foods are heated by a reaction between asparagine and reducing sugars. The mechanism of AAm formation and its inhibition was studied using a fried model system based on sliced pieces of potato. Thin potato slices were treated with water under different conditions before frying. A sufficient amount of water present in the fry material acted as an inhibitor of AAm formation and allowed only a negligible amount of AAm to form. It was found that given a low content of water, the fry material temperature was sufficiently high to allow a relatively large level of AAm to form. Higher temperature treatment water and

longer treatment times resulted in the formation of lower levels of AAm. Also, removing some of the residual heat inhibited the formation of AAm.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; FOOD SAFETY PLANT FOODS; FRYING; POTATOES; ACRYLAMIDE

L7 ANSWER 2 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2006:J4529 FSTA
TI Screening of acrylamide contents in potato crisps using process variable settings and near-infrared spectroscopy.
AU Segtnan, V. H.; Kita, A.; Mielnik, M.; Jorgensen, K.; Knutsen, S. H.
CS Matforsk, Norwegian Food Res. Inst., Osloveien 1, N-1430 As, Norway. Fax +47-64970333. E-mail vegard.segtnan(a)matforsk.no
SO Molecular Nutrition and Food Research, (2006), 50 (9, Special issue: Thermally Processed Foods: Possible Health Implications) 811-817, 23 ref.
ISSN: 1613-4125
DT Journal
LA English
AB Use of NIR spectroscopy as a means of screening potato crisps for acrylamide contents was examined. Potatoes were fried using design variables of frying temperature (160 or 185°C), frying time (8 levels) and subsequent drying time (6 levels). Ground potato crisp samples were analysed by NIR spectroscopy using various acrylamide prediction models (design variables using multiple linear regression, NIR spectra using partial least squares regression or a novel technique combining design variables and NIR spectra) and results correlated with acrylamide concentration as determined by LC with high resolution MS. All models showed relatively good prediction performance in relation to analytically determined acrylamide concentration Best results were obtained using models based on NIR spectra alone or in conjunction with design variables rather than those based on design variables alone. Results suggest that NIR spectroscopy has potential as a rapid means of screening potato crisps for excessive acrylamide contents.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; CHIPS; FOOD SAFETY PLANT FOODS; SPECTROSCOPY; ACRYLAMIDE ; NIR SPECTROSCOPY; POTATO CRISPS

L7 ANSWER 3 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2006:J4252 FSTA
TI Effects of storage temperature on the contents of sugars and free amino acids in tubers from different potato cultivars and acrylamide in chips.
AU Matsuura-Endo, C.; Ohara-Takada, A.; Chuda, Y.; Ono, H.; Yada, H.; Yoshida, M.; Kobayashi, A.; Tsuda, S.; Takigawa, S.; Noda, T.; Yamauchi, H.; Mori, M.
CS Dep. of Upland Agric., Nat. Agric. Res. Cent. for Hokkaido Reg., Memuro, Hokkaido 082-0071, Japan. Fax +81-155-62-2926. E-mail mechie(a)affrc.go.jp
SO Bioscience, Biotechnology, and Biochemistry, (2006), 70 (5) 1173-1180, 25 ref.
ISSN: 0916-8451
DT Journal
LA English
AB To clarify the effects of storage temperature on potato components and acrylamide content of potato chips, tubers from cv. Toyoshiro, Snowden, Irish Cobbler, Hokkai Number 89 and Inca-no-mezame were stored at various temperature (2, 6, 8, 10 or 18°C) for 18 wk, and the contents of sugars and free amino acids in tubers, and acrylamide in chips after frying were analysed. At temperature lower than 8°C, the contents of reducing sugars increased markedly during storage in all cultivars, with similar increases in the acrylamide level and dark brown colour of the chips. Free amino acids content showed little change at the storage temperature tested and varied within certain ranges characteristic for each cultivar. The contents of reducing sugars in the tuber correlated

well with the acrylamide level in the fried chips when the fructose/asparagine molar ratio in the tubers was <2. When the fructose/asparagine ratio was >2 (as occurred with low-temperature storage), the asparagine content, rather than the reducing sugars content, was the limiting factor for acrylamide formation.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; AMINO ACIDS; CHIPS; FOOD SAFETY PLANT FOODS; POTATOES; STORAGE; SUGARS; TEMPERATURE; ACRYLAMIDE; CV; POTATO CHIPS; REDUCING SUGARS; TEMP.

L7 ANSWER 4 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2006:J2791 FSTA
TI Reducing acrylamide in fried food.
IN Shannon, G.
PA Shannon, Boise, ID, USA
SO United States Patent Application Publication, (2006)
PI US 2006083832 A1
PRAI US @@@@-619577 20041018
DT Patent
LA English
AB A method is described for reducing levels of acrylamide in fried foods (e.g. potatoes). Potato strips are blanched in water at approx. 76-88°C for 3-10 min. During this step, the water is circulated. The water blanched potato strips are subsequently heated, with optional oil blanching, at approx. 149-177°C for 3-8 min. The final stage of the process involves heating the potato strips in oil at approx. 177-190°C for 1-5 min.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; BLANCHING; FOOD SAFETY PLANT FOODS; FRIED FOODS; HEATING; PATENTS; POTATOES; ACRYLAMIDE

L7 ANSWER 5 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2006:J2439 FSTA
TI [Significance of reducing sugars for deep-fried potato products.]
AU Haase, N. U.
CS Bundesforschungsanstalt fuer Ernaehrung und Lebensmittel, Detmold, Germany. Tel. 05231/741 453. Fax 05231/741 100. E-mail potato-detmold(a)bfel.de
SO Kartoffelbau, (2005), 57 (3) 124-127
ISSN: 0022-9156
DT Journal
LA German
AB Significance of potato reducing sugar contents for subsequent acrylamide formation in deep fried potato products (potato crisps and chips) is discussed with reference to data from a series of studies carried out on different varieties of potatoes grown at various locations in Germany over several years. Data are presented showing concentration of reducing sugars and free asparagine in raw material prior to frying and concentration of acrylamide in ready to eat potato crisps and chips. Results demonstrated the close association between reducing sugar contents and acrylamide formation in both potato crisps and chips. Recommendations are also presented for minimizing potential for acrylamide formation, based on selection of appropriate potato variety and cultivation and storage procedures. [Literature references for this article are available from the editorial offices of Kartoffelbau.]
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; CULTIVATION; FOOD SAFETY PLANT FOODS; FRYING; POTATOES; SUGARS; ACRYLAMIDE; DEEP FRYING; POTATO PRODUCTS; REDUCING SUGARS; VAR

L7 ANSWER 6 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2006:J1804 FSTA

TI Acrylamide in potato crisp - the effect of raw material and processing.
AU Wicklund, T.; Ostlie, H.; Lothe, O.; Knutsen, S. H.; Brathen, E.; Kita, A.
CS Department of Chemistry, Biotechnology and Food Science, Norwegian University of Life Sciences, P.O. Box 5003, N-1432 As, Norway. Tel. +47 64948566. Fax +47 64947720. E-mail trude.wicklund(a)umb.no
SO LWT - Food Science and Technology, (2006), 39 (5) 571-575
ISSN: 0023-6438
DT Journal
LA English
AB Reducing sugars and free amino acids were analysed in slices from three potato cultivars before and after blanching (0-3min). The potato crisps were deep fried at 185°C for different times (3-8.5 min), and analysed for the concentration of acrylamide (AA) and moisture. Potato cultivar and the temperature during processing were important parameters for AA formation in potato crisps. The amount increased with an increase in the processing time. Blanching before deep-frying reduced the concentration of free asparagine and reducing sugar in the raw material. We found no effect of blanching as pretreatment on the concentration of AA in the potato crisps. Any relationship was not detected between the levels of asparagine in the different cultivars, before and after blanching, and the formation of AA in the crisp products. However, it was shown that the content of reducing sugars determined the level of AA after frying.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; AMINO ACIDS; BLANCHING; CHIPS; FRYING; POTATOES; SUGARS; ACRYLAMIDE; ASPARAGINE; CV; DEEP FRYING; POTATO CRISPS; REDUCING SUGARS

L7 ANSWER 7 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2006:J1532 FSTA
TI Effect of raw potato composition on acrylamide formation in potato chips.
AU Granda, C.; Moreira, R. G.; Castell-Perez, E.
CS Correspondence (Reprint) address, R. G. Moreira, Dep. of Biol. & Agric. Eng., Texas A & M Univ., College Station, TX 77843, USA. E-mail rmoreira(a)tamu.edu
SO Journal of Food Science, (2005), 70 (9) E519-E524, 28 ref.
ISSN: 0022-1147
DT Journal
LA English
AB Recent studies have shown that subjecting foods to high temperature during cooking processes such as frying gives rise to the formation of acrylamide. Several factors including product composition and processing conditions affect the rate of formation of this chemical in starch-rich foods. Low contents of reducing sugars and the amino acid asparagine are desired when cooking because the formation of acrylamide is attributed to the Maillard reaction that occurs between these food components. Potatoes of cv. Atlantic were used to determine the effect of potato components (reducing sugars and asparagine) on acrylamide content during frying in a traditional fryer. A model system was developed by infusing leached potato slices with predetermined amounts of glucose and asparagine. Increasing glucose and asparagine contents in the slices increased the acrylamide content in the fried potato chips. Colour could not be used as an indication of acrylamide content because potato chips with similar colour had very different acrylamide concentration
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; AMINO ACIDS; CHIPS; FOOD SAFETY PLANT FOODS; FRYING; GLUCOSE; POTATOES; ACRYLAMIDE; ASPARAGINE; POTATO CHIPS

L7 ANSWER 8 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2006:J0372 FSTA
TI Change in content of sugars and free amino acids in potato tubers under short-term storage at low temperature and the effect on acrylamide

level after frying.
AU Ohara-Takada, A.; Matsuura-Endo, C.; Chuda, Y.; Ono, H.; Yada, H.; Yoshida, M.; Kobayashi, A.; Tsuda, S.; Takigawa, S.; Noda, T.; Yamauchi, H.; Mori, M.
CS Dep. of Upland Agric., Nat. Agric. Res. Cent. for Hokkaido Reg., Memuro, Hokkaido 082-0071, Japan. Fax +81-155-61-2127. E-mail aohara(a)affrc.go.jp
SO Bioscience, Biotechnology, and Biochemistry, (2005), 69 (7) 1232-1238, 26 ref.
ISSN: 0916-8451
DT Journal
LA English
AB Changes in the sugar and amino acid contents of potato tubers during short-term storage (2 or 4 wk at 2°C or 4 wk at 18°C) and their effect on the acrylamide level in chips after frying were investigated. Potato cv. Toyoshiro was used since this cultivar is commonly used in Japan for manufacture of potato chips. Results show that the acrylamide content of the potato chips began to increase after 3 days of storage at 2°C in response to the increase in glucose and fructose contents in the tubers. There was strong correlation between reducing sugar content of the potato tubers and the acrylamide level in the fried chips, R.sup.2 = 0.873 for fructose and R.sup.2 = 0.836 for glucose. The sucrose content had less correlation with the acrylamide content, as it decreased after 4 wk of storage at 2°C, while the reducing sugars content in potato tubers and the acrylamide content of potato chips continued to increase. Tuber contents of asparatic acid, asparagine, glutamic acid and glutamine, showed no significant correlation with the acrylamide level in the fried chips. These results suggest that the content of reducing sugars in potato tubers determined the degree of acrylamide formation in potato chips. Chip colour, as evaluated by L* (lightness) correlated well with acrylamide content.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; AMINO ACIDS; CHIPS; COLOUR; FOOD SAFETY PLANT FOODS; POTATOES; STORAGE; SUCROSE; SUGARS; ACRYLAMIDE; POTATO CHIPS; REDUCING SUGARS

L7 ANSWER 9 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2006:J0134 FSTA
TI Acrylamide content and color development in fried potato strips.
AU Pedreschi, F.; Kaack, K.; Granby, K.
CS Departmento de Ciencia y Tecnologia de los Alimentos, Facultad Tecnologica, Universidad de Santiago de Chile (USACH), Av. Ecuador 3769, Santiago, Chile. Tel. +56 93 591 679. Fax +56 26 823 536. E-mail fpedresc(a)lauca.usach.cl
SO Food Research International, (2006), 39 (1) 40-46
ISSN: 0963-9969
DT Journal
LA English
AB Acrylamide formation and changes in color of fried potato strips was investigated in relation to frying temperature and three treatments before frying. Potato strips (0.8x0.8x5cm) of Bintje variety were fried at 150, 170 and 190°C until reaching moisture contents of approx. equal to 40g water/100g (total basis). Prior to frying, potato strips were treated in one of the following ways: (i) immersed in distilled water for 0min (control), 60min and 120min; (ii) blanched in hot water at six different time-temperature combinations (50°C for 40 and 80min; 70°C for 10 and 45min; 90°C for 3 and 10min); (iii) immersed in a citric acid solution of 10g/L for an hour; (iv) immersed in a sodium pyrophosphate solution of 10g/L for an hour. Acrylamide content and color was determined in the potato strips after frying. Immersed strips in water for 120 min showed a reduction of acrylamide formation of 33%, 21% and 27% at 150,

170 and 190°C, respectively, when they were compared against the control. Potato strips blanched at 50°C for 80min had the lowest acrylamide content when compared against strips blanched at different conditions and fried at the same temperature (135, 327 and 564μm acrylamide/kg for 150, 170 and 190°C, respectively). Potato strip immersion in citric acid solution of 10g/L reduced much more the acrylamide formation after frying than the strip immersion in sodium pyrophosphate solution of 10g/L (53% vs. 17%, respectively, average values for the three temperatures tested). Acrylamide formation decreased dramatically as the frying temperature decreased from 190 to 150°C for all the pre-treatments tested. Color represented by the parameters L* and a* showed high correlations (r.sup.2 of 0.79 and 0.83, respectively) with French fry acrylamide content. All rights reserved, Elsevier.

CC J (Fruits, Vegetables and Nuts)

CT AMIDES; COLOUR; FRIED FOODS; POTATOES; PROCESSING; TEMPERATURE; ACRYLAMIDE; POTATO PRODUCTS; TEMP.

L7 ANSWER 10 OF 29 FSTA COPYRIGHT 2006 IFIS on STN

AN 2005:J3246 FSTA

TI Aspects of acrylamide formation in potato crisps.

AU Haase, N. U.; Matthaeus, B.; Vosmann, K.

CS Inst. for Cereal, Potato & Starch Tech., Fed. Res. Cent. for Nutr. & Food, D-32756 Detmold, Germany

SO Journal of Applied Botany and Food Quality/Angewandte Botanik, (2004), 78 (3) 144-147, 29 ref.
ISSN: 1613-9216

DT Journal

LA English

AB Studies were conducted to investigate effects on the acrylamide content of potato crisps of the variety of potato used, the cultivation environment and storage temperature (4 or 8°C) to which the potato was exposed and the crisp processing conditions used (frying temperature, residual moisture and blanching). Results show that reducing sugars content of the potato correlated directly with the acrylamide content of the potato crisps (r = 0.71), and that cultivation environment also had an effect. Storage of potatoes at 4°C increased the reducing sugars content of the potato. The residual moisture content of the crisps correlated negatively with acrylamide concentration (r = -0.58), but positively with a loss of crispness. Frying temperature had a significant positive effect on acrylamide formation, while introduction of a blanching step before frying decreased acrylamide concentration in the fried potato crisps.

CC J (Fruits, Vegetables and Nuts)

CT AMIDES; BLANCHING; CHIPS; CULTIVATION; FOOD SAFETY PLANT FOODS; FRYING; MOISTURE CONTENT; POTATOES; STORAGE COLD; SUGARS; TEMPERATURE; ACRYLAMIDE; COLD STORAGE; ENVIRONMENT; POTATO CRISPS; REDUCING SUGARS; TEMP.; VAR

L7 ANSWER 11 OF 29 FSTA COPYRIGHT 2006 IFIS on STN

AN 2005:J0961 FSTA

TI Acrylamide in heated potato products - analytics and formation routes.

AU Weisshaar, R.

CS Chem. und Veterinaeruntersuchungsamt Stuttgart, Schaflandstrasse 3, 70736 Fellbach, Germany. Tel. +49-711-957-1232. Fax +49-711-588-176. E-mail ruediger.weisshaar(a)cvuas.bwl.de

SO European Journal of Lipid Science and Technology, (2004), 106 (11) 786-792
ISSN: 1438-7697

DT Journal

LA English

AB Acrylamide is a highly polar, water-soluble molecule with low, but significant volatility. Most common methods for determination of acrylamide are HPLC-tandem MS (LC-MS-MS), GC MS after bromination, GC MS without and LC-MS after derivatisation with mercaptobenzoic acid.

In this study, the different clean-up procedures were tested and advantages and disadvantages of the individual methods were investigated using heated potato products. Acrylamide is formed during food preparation if free asparagine and reducing sugars are present, a.sub.w is low and the product temperature exceeds 100°C. The influence of different parameters on acrylamide formation in model systems is discussed. In fried potatoes the greatest amount of acrylamide is formed from asparagine and reducing sugars. Alternative routes of formation, for example via acrolein and acrylic acid, are less important.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; ANALYTICAL TECHNIQUES; FOOD SAFETY; POTATOES; ACRYLAMIDE; POTATO PRODUCTS

L7 ANSWER 12 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2005:J0799 FSTA
TI Influence of variety and processing conditions on acrylamide levels in fried potato crisps.
AU Williams, J. S. E.
CS Campden & Chorleywood Food Res. Ass., Chipping Campden GL55 6LD, UK
SO Food Chemistry, (2005), 90 (4) 875-881, 18 ref.
ISSN: 0308-8146
DT Journal
LA English
AB Influence of potato variety, cooking oil type and level of oxidation, and processing conditions (temperature, time and soaking) on the acrylamide content of potato crisps was investigated. Potatoes of var. Courage, Estima, Hermes, Maris Piper or Saturna were fried in a vegetable oil or palm oil for 3 or 5 min at 150 or 175°C; in addition, a portion of the potatoes were soaked for 2 h at room temperature in water prior to frying. Results demonstrated that, of the factors studied, only variety, cooking temperature and cooking time significantly affected acrylamide content of the potato crisps. Further studies revealed that the reducing sugars content of the potatoes , but not the asparagine content, influenced the level of acrylamide formation during frying.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; CHIPS; FOOD SAFETY PLANT FOODS; FRYING; OILS VEGETABLE; OXIDATION; PALM OILS; POTATOES; SOAKING; ACRYLAMIDE; POTATO CRISPS; VAR; VEGETABLE OILS

L7 ANSWER 13 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2005:J0671 FSTA
TI [Acrylamide - the state of knowledge two years after discovery of the problem.]
AU Hebeisen, T.; Ballmer, T.; Reust, W.; Torche, J. M.
CS Agroscope FAL Reckenholz, Eidgenossische Forschungsanstalt fuer Agrarbiol. und Landbau, CH-8046 Zurich, Switzerland. Tel. +41 (0)1 3777450. Fax +41 (0)1 3777201. E-mail thomas.hebeisen(a)fal.admin.ch
SO AgrarForschung, (2004), 11 (9) 411-414, 8 ref.
ISSN: 1022-663X
DT Journal
LA German
AB The acrylamide problem in roasted, baked or fried potato products and other foods is discussed with reference to: the mechanism of formation of acrylamide in heated foods; acrylamide concentration in various foods; toxicology of acrylamide; factors influencing acrylamide formation in foods; cultivar differences in acrylamide formation; effects of reducing sugar and free amino acid concentration on acrylamide formation in potato products; effects of potato storage temperature on subsequent acrylamide formation; and the relation of the degree of browning to acrylamide concentration in cooked potato products.
CC J (Fruits, Vegetables and Nuts)

CT AMIDES; FOOD SAFETY PLANT FOODS; POTATOES; ACRYLAMIDE; POTATO PRODUCTS

L7 ANSWER 14 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2005:J0478 FSTA
TI Reduction of acrylamide formation in potato chips by low-temperature vacuum frying.
AU Granada, C.; Moreira, R. G.; Tichy, S. E.
CS Correspondence (Reprint) address, R. G. Moreira, Dep. of Biol. & Agric. Eng., Texas A&M Univ., College Station, TX 77843-2117, USA. E-mail rmoreira(a)tamu.edu
SO Journal of Food Science, (2004), 69 (8) E405-E411, 10 ref. ISSN: 0022-1147
DT Journal
LA English
AB Potatoes and other foods that have a high content of the amino acid asparagine and a high accumulation of reducing sugars are subject to the formation of acrylamide upon frying. The objectives of this research were: to analyse the level of acrylamide formed during deep-fat frying of potato chips; and to evaluate means of reducing acrylamide in potato chips by using different potato cultivars and vacuum frying. Several potato cultivars were used in this research, including Innovator (I), NDTX 4930-5W (N), ATX 854 04-8W (ATw), Atlantic (A), Shepody (S), ATX847806-2Ru (ATr) and White-Rose (W). An electric bench-top (atmospheric conditions)-type fryer was used to fry the potatoes. 3 temperature were used: 150, 165 and 180°C. The vacuum frying experiments were performed at 118, 125 and 140°C and a vacuum pressure of 10 Torr. The potatoes were sliced (1.5-mm thick) and fried for different lengths of time. For potatoes fried at 165°C (for 4 min) at atmospheric conditions, the acrylamide contents were 5021 ± 55 ppb (W), 552 ± 25 ppb (I), 358 ± 50 ppb (N), 397 ± 25 ppb (ATw), 646 ± 55 ppb (A), 466 ± 15 ppb(S) and 537 ± 14 ppb (ATr). Vacuum frying reduced acrylamide formation by 94%. Results showed that both cultivar and modified frying systems can play an important role in reducing acrylamide formation in fried potatoes. As the frying temperature decreased from 180 to 165°C, acrylamide content in potato chips reduced by 51% during traditional frying and by 63% as the temperature decreased from 140 to 125°C in vacuum frying. Increased frying time increased acrylamide formation during traditional frying for all temperature and frying methods analysed. However, the effect on acrylamide concentration was greater for the traditional frying than the vacuum frying.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; CHIPS; FOOD SAFETY PLANT FOODS; FRYING; TEMPERATURE; VACUUM; ACRYLAMIDE; CV; POTATO CHIPS; TEMP.

L7 ANSWER 15 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2005:C0990 FSTA
TI Determination of acrylamide levels in selected traditional foodstuffs and drinks in Jordan.
AU Al-Dmoor, H. M.
CS Food Sci., Dep. of Nutr. & Food Tech., Fac. of Agric., Al-Balqa Applied Univ., Al-Salt, Jordan. E-mail dmour(a)bau.edu.jo
SO Journal of Food, Agriculture & Environment, (2005), 3 (2) 77-80, 16 ref. ISSN: 1459-0255
DT Journal
LA English
AB Acrylamide levels in foods typically consumed in Jordan were investigated. Foods tested included bakery products, traditional Arabic dishes and coffees. Acrylamide contents of yeast-fermented whole flour bread (black kmaj) and 2 boiled wheat dishes (maftool and bulgur) were below detectable levels (180 µg/kg). However, fried bread leavened by sodium bicarbonate was found to contain acrylamide levels of 2300 µg/kg and taboon bread, which has a

long baking time, contained 2300 µg/kg. Some traditional dishes demonstrated relatively high concentration of acrylamide, including Kobeht potatoes (4200 µg/kg), whereas shawarmah (browned chicken fricasee) contained relatively small amounts (600 µg/kg). The black and brown types of Arabic coffee contained 1600 and 1200 µg/kg acrylamide, respectively, and cocoa powder contained 1100 µg/kg. High levels of acrylamide were found to be associated with uncooked pH values >6.5 and either prolonged or dry heat treatments.
CC C (Hygiene and Toxicology)
CT AMIDES; BAKERY PRODUCTS; COFFEE; FOOD SAFETY; MEALS; ACRYLAMIDE; DISHES; JORDAN

L7 ANSWER 16 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2004:J2975 FSTA
TI Solid-phase extraction and cleanup procedures for determination of acrylamide in fried potato products by liquid chromatography/mass spectrometry.
AU Young, M. S.; Jenkins, K. M.; Mallet, C. R.
CS Waters Corp., 34 Maple St., Milford, MA 01757, USA. E-mail michael_s_young(a)waters.com
SO Journal of AOAC International, (2004), 87 (4) 961-964, 9 ref.
ISSN: 1060-3271
DT Journal
LA English
AB In response to recent discoveries of acrylamide in heated foods, a solid-phase extraction and cleanup protocol was developed for the determination of acrylamide in fried or baked potato samples by LC/MS. The analyte was extracted from the matrix using 2M NaCl, and an aliquot of the initial extract was loaded onto a reversed-pase cartridge. After the analyte was eluted from the cartridge, the eluate was cleaned up on a mixed-mode cation-exchange cartridge. The eluate was then evaporated, and the residue was reconstituted in mobile phase before LC/MS analysis. Recoveries, based on the recovery of an added internal standard, ranged from 96 to 101% with relative s.d. (RSD) of 5-11%. Response was linear for a concentration range of 100-2000 ng/g, with a coefficient of determination (R.sup.2) of 0.992 (n = 25). An interday study showed good accuracy and precision of the method over a 3-day period, with a recovery of 98% and an RSD of 9.5% (n = 15). Analyses of 6 potato chip samples showed concentration of incurred acrylamide ranging from 260 to 1500 ng/g.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; ANALYTICAL TECHNIQUES; FOOD SAFETY PLANT FOODS; FRIED FOODS; HIGH PERFORMANCE LIQUID CHROMATOGRAPHY; MASS SPECTROSCOPY; POTATOES; ACRYLAMIDE; LC; MS; POTATO PRODUCTS; SOLID PHASE EXTRACTION

L7 ANSWER 17 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2004:J2094 FSTA
TI Influence of processing parameters on acrylamide formation during frying of potatoes.
AU Taubert, D.; Harlfinger, S.; Henkes, L.; Berkels, R.; Schoemig, E.
CS Dep. of Pharmacology, Univ. of Cologne, D-50931 Cologne, Germany. Tel. +49 221 4784196. Fax +49 221 4785022. E-mail dirk.taubert(a)medizin.uni-koeln.de
SO Journal of Agricultural and Food Chemistry, (2004), 52 (9) 2735-2739, 22 ref.
ISSN: 0021-8561
DT Journal
LA English
AB Consistent evidence suggests that the probable human carcinogen acrylamide is formed in starch-rich foods through heat-induced interaction of asparagine and reducing sugars during Maillard browning. However, information regarding the influence of processing parameters on acrylamide formation is scarce. This study investigated the

impact of temperature (120-230°C), heating time (≤1 h), browning level and surface-to-volume ratio (SVR; 0.27, 0.80 or 2.12 mm.sup.-.sup.1) on acrylamide generation in fried potatoes (cv. Bintje). Acrylamide content was determined by LC and electrospray ionization tandem MS (ESI-MS/MS). In potato shapes with low SVR, acrylamide content consistently increased with increasing temperature and processing times. By contrast, in shapes with intermediate to high SVR, maximum acrylamide formation occurred at 160-180°C, while higher temperature or prolonged processing times caused a decrease of acrylamide levels. Moreover, browning levels were not a reliable measure of acrylamide content in large-surface products.

CC J (Fruits, Vegetables and Nuts)

CT AMIDES; BROWNING; FOOD SAFETY PLANT FOODS; FRIED FOODS; FRYING; PHYSICAL PROPERTIES; POTATOES; TEMPERATURE; ACRYLAMIDE ; SHAPE; TEMP.

L7 ANSWER 18 OF 29 FSTA COPYRIGHT 2006 IFIS on STN

AN 2004:J2060 FSTA

TI Tuber components affecting acrylamide formation and colour in fried potato: variation by variety, year, storage temperature and storage time.

AU Olsson, K.; Svensson, R.; Roslund, C. A.

CS Svalof Weibull AB, SE-268 81 Svalov, Sweden. E-mail kerstin.olsson(a)swseed.com

SO Journal of the Science of Food and Agriculture, (2004), 84 (5) 447-458, 25 ref.
ISSN: 0022-5142

DT Journal

LA English

AB Asparagine and glucose have been identified as precursors of acrylamide formation during cooking of potatoes. In this study, levels of asparagine, glutamine and sugars were determined in potatoes during long term (up to 8 months) storage at 3 and 10°C. 8 potato genotypes harvested during 3 different yr were analysed and factors influencing colour formation during preparation of fried potato crisps were also determined. Significant variations in levels of the measured parameters in potatoes harvested in different yr were observed, but yr had no effect on average crisp colour. Long term storage at both temperature had no effect on glutamine or asparagine levels, but glucose, fructose and sucrose concentration tended to be higher and subject to greater fluctuations at the lower storage temperature Average crisp colour was darker after storage at the colder temperature The genotype effect was highly significant for all studied components and for crisp colour ($P \leq 0.001$).

CC J (Fruits, Vegetables and Nuts)

CT AMINO ACIDS; CHIPS; COLOUR; GENETICS; POTATOES; SUGARS; ASPARAGINE; GENOTYPE; GLUTAMINE; POTATO CRISPS

L7 ANSWER 19 OF 29 FSTA COPYRIGHT 2006 IFIS on STN

AN 2004:J0906 FSTA

TI Complex proceedings. Frying fats and acrylamide in products.

AU Reimerdes, E. H.; Kreyenmeier, F.; Franke, K.

CS Deutsches Inst. fuer Lebenmitteltech. (DIL), Quakenbrueck, Germany. E-mail reimerdes(a)dil-ev.de

SO Lebensmitteltechnik, (2003), 35 (6) 47, 2 ref.
ISSN: 0047-4290

DT Journal

LA German

AB The antifoaming agent dimethylpolysiloxane (DMPS) is often added to frying fats (at approx. 1.5 mg/kg) to protect against fat oxidation. In this study, the possible influence of DMPS on acrylamide formation in pommes frites was examined as part of an ongoing investigation into acrylamide in foods. Vegetable fat with or without added DMPS was used to fry parallel batches of pommes frites over a period of 5 days. A

comparison of acrylamide values taken over the entire 5-day period revealed no difference between samples fried in vegetable fat alone and those fried in vegetable fat with added DMPS.
CC J (Fruits, Vegetables and Nuts)
CT ADDITIVES; AMIDES; CHIPS; FATS VEGETABLE; FOOD SAFETY PLANT FOODS; FRYING; POTATOES; ACRYLAMIDE; DIMETHYLPOLYSILOXANE; POMMES FRITES; VEGETABLE FATS

L7 ANSWER 20 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2004:J0855 FSTA
TI How much reducing sugar may potatoes contain to avoid excessive acrylamide formation during roasting and baking?
AU Biedermann-Brem, S.; Noti, A.; Grob, K.; Imhof, D.; Bazzocco, D.; Pfefferle, A.
CS Correspondence (Reprint) address, K. Grob, Official Food Control Authority of the Canton of Zurich, PO Box 8030, Zurich, Switzerland. E-mail Konrad.Grob(a)klzh.ch
SO European Food Research and Technology, (2003), 217 (5) 369-373, 15 ref.
ISSN: 1438-2377
DT Journal
LA English
AB For many consumers, eating potatoes fried or roasted in professional or private kitchens is a major source of acrylamide exposure. Acrylamide formation may be reduced by appropriate preparation techniques, but suitable potatoes are a prerequisite. The tendency of potato to form acrylamide can be approximated from the reducing sugar content. Roasted potatoes (hash browns, Rosti) and oven-fried potatoes (Bratkartoffeln) were prepared to optimum culinary quality regarding crispness and then evaluated in terms of browning, roasted flavour and acrylamide content. Preparation procedures were optimized to minimize acrylamide content. Results showed that potatoes with <0.2 g/kg fresh weight of fructose and glucose were not suitable for roasting (insufficient browning and flavour), while roasted products of min. crispness prepared from potatoes with >1 g/kg reducing sugar content contained >500 µg/kg acrylamide . It is proposed that potatoes to be used for roasting or frying should contain <1 g/kg fresh weight of reducing sugar; this can be fulfilled easily by using the most important potato cultivars grown in Switzerland, but presupposes that potatoes are not stored at 4°C, which increases reducing sugar content.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; FOOD SAFETY PLANT FOODS; FRYING; POTATOES; ROASTING; SUGARS; ACRYLAMIDE; REDUCING SUGARS

L7 ANSWER 21 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2004:J0572 FSTA
TI Acrylamide - the entire formation process is decisive!
AU Franke, K.; Kreyenmeier, F.; Reimerdes, E. H.
CS Correspondence (Reprint) address, F. Kreyenmeier, Deutsches Inst. fuer Lebensmitteltechnik eV, Quakenbruck, Germany. E-mail f_kreyenmeier(a)dil-ev.de
SO Lebensmitteltechnik, (2003), 35 (3) 60-62, 12 ref.
ISSN: 0047-4290
DT Journal
LA German
AB The need for a multifaceted approach to analysis of acrylamide in foods is discussed, and results of preliminary studies are presented demonstrating effects of process variables on acrylamide formation during frying of potatoes. Deep-frozen pommes frites (≤10 batches of 680 g) were sequentially fried in rapeseed oil for 3 min using fresh frying oil each time and analysed for acrylamide concentration Considerable variation in acrylamide levels was found between batches (average concentration 151-353 µg/kg) despite standard frying conditions. Acrylamide concentration increased

markedly during the 1st few fryings and this was related to increasing temperature in frier as the cold zone became heated. Further analyses revealed direct correlation between frying temperature, potato colour (browning) and acrylamide concentration Results are discussed with regard to the significance of variables such as raw material, processing conditions and product quality when developing strategies to minimize acrylamide formation during food processing.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; CHIPS; COLOUR; FOOD SAFETY PLANT FOODS; FRYING; POTATOES ; TEMPERATURE; ACRYLAMIDE; POMMES FRITES; TEMP.

L7 ANSWER 22 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2004:J0093 FSTA
TI Acrylamide in food: a model for mechanism of formation and its reduction.
AU Vattem, D. A.; Shetty, K.
CS Correspondence (Reprint) address, K. Shetty, Lab. of Food Biotech., Dep. of Food Sci., Univ. of Massachusetts, MA 01003, USA. Tel. +1-413-545-1022. Fax +1-413-545-1262. E-mail kalidas(a)foodsci.umass.edu
SO Innovative Food Science and Emerging Technologies, (2003), 4 (3) 331-338, 43 ref.
ISSN: 1466-8564
DT Journal
LA English
AB Acrylamide formation during frying and potential mechanisms for its reduction were investigated. Potatoes were sliced and soaked in water (control), soaked in solutions of cranberry powder and oregano extract, or dipped in chick pea batter. Slices were fried for ≤10 min and analysed for protein and phenols contents, antioxidative activity and acrylamide content. Acrylamide formation was not influenced by presence of phenolic antioxidants from cranberry powder and oregano extracts, whereas chick pea proteins appeared to have a protective effect against acrylamide formation. Results suggest that acrylamide formation in high starch foods is not an oxidative phenomenon. A non-oxidative model for the mechanism of acrylamide formation in fried foods, implicating glucose degradation and the Maillard reaction, was developed based on these results.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; BAKERY PRODUCTS; CHICK PEAS; COATINGS; FOOD SAFETY PLANT FOODS; FRYING; MAILLARD REACTION; POTATOES; ACRYLAMIDE; BATTERS; MODELLING

L7 ANSWER 23 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2004:G0958 FSTA
TI Brown potato croquettes low in acrylamide by coating with egg/breadcrumbs.
AU Fiselier, K.; Grob, K.; Pfefferle, A.
CS Correspondence (Reprint) address, K. Grob, Official Food Control Authority of the Canton of Zurich, PO Box, 8030 Zurich, Switzerland. Tel. +41-43-2447131. E-mail konrad.grob(a)klzh.ch
SO European Food Research and Technology, (2004), 219 (2) 111-115, 14 ref.
ISSN: 1438-2377
DT Journal
LA English
AB Potato croquettes are preparations of mashed potato or potato powder with milk powder or egg, fried in oil or baked in the oven. Product identity calls for fairly strong browning, which may cause high acrylamide contents. In this study, potential for acrylamide formation was determined for samples of frozen convenience products available on the Swiss market and freshly prepared croquettes. Furthermore, the contributions to acrylamide formation of the various components used to prepare croquette potato dough were determined, as well as the effects of coating. Prefabricates resulted in products with an intermediate acrylamide content

(50-570 µg/kg), which was strongly dependent on the time and temperature of frying. The potential for acrylamide formation was modest for these products since the potato powder used was low in reducing sugars and asparagine. 2-6% defatted milk powder (1-3% lactose) increased the potential for acrylamide formation at 120°C by 200-700 µg/kg, whereas egg was approx. neutral. Coating with egg/breadcrumbs resulted in stronger browning, and reduced acrylamide formation since its browning is not associated with acrylamide formation and it shields the potato from heat. Croquettes prepared from fresh potato confirmed that coating with egg/breadcrumbs improved the produce quality, while strongly decreasing the acrylamide content.
CC G (Catering, Speciality and Multicomponent Foods)
CT AMIDES; COATING; FOOD SAFETY; FRYING; POTATOES; PROCESSED FOODS; TEMPERATURE; ACRYLAMIDE; INGREDIENTS; POTATO PRODUCTS; TEMP.

L7 ANSWER 24 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2003:J1390 FSTA
TI Acrylamide formation in foodstuffs - minimising strategies for potato crisps.
AU Haase, N. U.; Matthaeus, B.; Vosmann, K.
CS Bundesanstalt fuer Getreide-, Kartoffel- und Fettforschung, Inst. fuer Getreide-, Kartoffel- und Staerketech., Schuetzenberg 12, D-32756 Detmold, Germany
SO Deutsche Lebensmittel-Rundschau, (2003), 99 (3) 87-90, 16 ref.
ISSN: 0012-0413
DT Journal
LA German
SL English
AB Factors influencing acrylamide formation in potato crisps were investigated with the aim of identifying methods for its reduction. Effects of potato cultivar, location of cultivation and processing parameters (blanching or soaking before frying, frying temperature) were assessed. Both potato cultivar and location of cultivation significantly influenced acrylamide formation in the final product; effects of potato cultivar differed between early and late cultivars. Reduction of sugar content of the potatoes by either blanching or soaking in water decreased acrylamide concentration by up to 60%; blanching and soaking gave similar decreases in acrylamide formation. Blanching reduced more glucose/fructose than sucrose; the opposite was observed for soaking. Total reducing sugars concentration in the potatoes was significantly correlated with acrylamide formation in the fried product (r.sup.2 = 0.64). Concentration of glucose and fructose were significantly correlated with acrylamide concentration in the crisps (r.sup.2 = 0.60 and r.sup.2 = 0.56 respectively), but sucrose concentration was not significantly correlated with acrylamide concentration (r.sup.2 = 0.24). In cv. Tomensa, reducing frying temperature from 185 to 165°C reduced acrylamide concentration by half; in cv. Saturna, reducing frying temperature from 190 to 150°C reduced acrylamide concentration by two-thirds.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; CHIPS; FOOD SAFETY PLANT FOODS; FRYING; SUGARS; TEMPERATURE; CV; POTATO CRISPS; REDUCING SUGARS; TEMP.

L7 ANSWER 25 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2003:J1339 FSTA
TI Analysis of acrylamide by LC-MS/MS and GC-MS in processed Japanese foods.
AU Ono, H.; Chuda, Y.; Ohnishi-Kameyama, M.; Yada, H.; Ishizaka, M.; Kobayashi, H.; Yoshida, M.
CS Correspondence (Reprint) address, M. Yoshida, Nat. Food Res. Inst., 2-1-12 Kannondai, Tsukuba, Ibaraki 305-8642, Japan. E-mail mitsuru(a)nfri.affrc.go.jp
SO Food Additives and Contaminants, (2003), 20 (3) 215-220, 7 ref.

ISSN: 0265-203X
DT Journal
LA English
AB Acrylamide concentration in processed potato and cereal products from Japan (63 samples covering 31 product types) were analysed using LC-MS/MS and GC MS. The limit of detection and limit of quantification of acrylamide were 0.2 and 0.8 ng/ml, respectively, using LC-MS/MS, and those of 2,3-dibromopropionamide derived from acrylamide were 12 and 40 ng/ml, respectively, using GC MS. Repeatability given as relative s.d. was <5 and 15% for LC-MS/MS and GC MS, respectively. A high correlation (r.sup.2 = 0.946) was observed between values obtained using the 2 methods. Most potato crisps and whole potato-based fried snacks contained acrylamide concentration >1000 µg/kg. Concentration in non-whole potato-based snacks, rice crackers processed by grilling or frying, and candied sweet potatoes were lower compared with those in potato crisps and whole potato-based fried snacks. One of the whole potato-based fried snacks, however, had a low acrylamide concentration (<50 µg/kg) suggesting that the formation of acrylamide is strongly influenced by processing conditions. Acrylamide concentration in instant precooked noodles and won-tons were <100 µg/kg with only 1 exception. Roasted barley grains for mugicha tea contained 200-600 µg/kg acrylamide.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; CEREAL PRODUCTS; FOOD SAFETY; GAS CHROMATOGRAPHY; HIGH PERFORMANCE LIQUID CHROMATOGRAPHY; MASS SPECTROSCOPY; POTATOES; PROCESSED FOODS; GC MS; LIQUID CHROMATOGRAPHY; POTATO PRODUCTS

L7 ANSWER 26 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2003:C0323 FSTA
TI Verification of the findings of acrylamide in heated foods.
AU Ahn, J. S.; Castle, L.; Clarke, D. B.; Lloyd, A. S.; Philo, M. R.; Speck, D. R.
CS Correspondence (Reprint) address, L. Castle, Dep. for Environment, Food & Rural Affairs, Central Science Laboratory, Sand Hutton, York, YO41 1LZ, UK. E-mail l.castle(a)csl.gov.uk
SO Food Additives and Contaminants, (2002), 19 (12) 1116-1124, 13 ref.
ISSN: 0265-203X
DT Journal
LA English
AB An LC-MS/MS method was developed for determination of acrylamide levels in foods, and was used in conjunction with an established GC-MS procedure to verify the results of the study undertaken in 2002 by the Swedish National Food Authority and the University of Stockholm. Foods tested included crispbreads, potato crisps, breakfast cereals and foods heated under home-cooking conditions (including toast, chips fried in olive oil and baked and grilled potatoes). LC-MS/MS was found to be suitable for the direct determination of acrylamide in aqueous extracts of foods by isotope dilution MS using triply deuterated acrylamide. Some food matrices were not suited to the new method, and mixed-mode solid-phase extraction was used to clean these extracts. There was good agreement between the LC-MS/MS and the GC-MS results, and the levels of acrylamide found were similar to those reported for the corresponding foods analysed in the Swedish study. The analyses confirmed that acrylamide is absent from raw or boiled foods but present at significant levels in fried, grilled, baked and toasted foods. The highest levels observed were 12 000 µg/kg acrylamide in overcooked oil-fried chips; acrylamide levels appeared to be related to degree of browning.
CC C (Hygiene and Toxicology)
CT AMIDES; BREAD; CEREAL PRODUCTS; CHIPS; FOOD SAFETY; GAS CHROMATOGRAPHY; HIGH PERFORMANCE LIQUID CHROMATOGRAPHY; MASS SPECTROSCOPY; POTATOES; ACRYLAMIDE; BREAKFAST CEREALS; CRISPBREADS; GC MS; LIQUID CHROMATOGRAPHY; POTATO CRISPS; TOAST

L7 ANSWER 27 OF 29 FSTA COPYRIGHT 2006 IFIS on STN

AN 2003:C0299 FSTA
TI Acrylamide in foods - screening results from food control in Baden-Wuerttemberg.
AU Gutsche, B.; Weisshaar, R.; Buhlert, J.
CS Chem. und Veterinaeruntersuchungsamt Stuttgart, D-70736 Fellbach, Germany. E-mail birgit.gutsche(a)CVUAS.bwl.de
SO Deutsche Lebensmittel-Rundschau, (2002), 98 (12) 437-443, 14 ref. ISSN: 0012-0413
DT Journal
LA German
SL English
AB Two HPLC-MS/MS methods, using electrospray ionization in positive mode for determination of acrylamide in foods are described, based on the methods of Rosen & Hellenas [FSTA (2003) 35 1Cf79]. Samples are defatted, acrylamide-d.sub.3 is added as an internal standard, the sample is extracted with water in an ultrasonic bath, proteins are precipitated with Carrez reagent, the extracts are cleaned up by filtering solid phase microextraction, and analysed by HPLC on a Hypercarb column with tandem MS. Acrylamide is identified by mass transitions at m/z 72 > 55, 72 > 54 and 72 > 44; acrylamide-d.sub.3 is identified by mass transitions at m/z 75 > 58 and 75 >44, using 2 different mass spectrometers. In-house validation data such as recovery (approx. 96%), repeatability (1.7-6.9% residual s.d.) and reproducibility over 19 analyses (11% residual s.d.) confirm reliability of the method. Data from screening of 279 samples of foods over the period May to Aug. 2002 confirm literature data for acrylamide concentration in foods, and indicate high acrylamide concentration in heated carbohydrate-rich foods such as fried potatoes or cereal products. Comparison of data for different batches of the same product showed that acrylamide concentration varied significantly within products (residual s.d. 17-36%). Model studies on heating of dried mashed potatoes showed that decomposition of acrylamide occurs on prolonged heating. Trials on household-style preparation of potato chips suggested that, to avoid excessive acrylamide concentration, it is advisable not to exceed gold/yellow browning.
CC C (Hygiene and Toxicology)
CT AMIDES; COOKING; FOOD SAFETY; HIGH PERFORMANCE LIQUID CHROMATOGRAPHY; MASS SPECTROSCOPY; PROCESSED FOODS; ACRYLAMIDE; HPLC; MS

L7 ANSWER 28 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2002:J2959 FSTA
TI Recent research on acrylamide found in fried potato foods.
AU Wu Yinglong; He Guoqing; Ying Tiejin
CS Dep. of Food Sci. & Nutr., Zheijiang Univ., Hangzhou 310029, China
SO Food & Fermentation Industries, (2002), 28 (7) 71-75, 11 ref. ISSN: 0253-990X
DT Journal
LA Chinese
SL English
AB Recent research into levels of acrylamide found in fried or baked potato foods is discussed, together with analytical techniques for acrylamide determination (including GC MS and LC/MS/MS) and toxicity data.
CC J (Fruits, Vegetables and Nuts)
CT AMIDES; ANALYTICAL TECHNIQUES; BAKING; FRYING; POTATOES; TOXICITY; ACRYLAMIDES

L7 ANSWER 29 OF 29 FSTA COPYRIGHT 2006 IFIS on STN
AN 2002:C1112 FSTA
TI Analysis of acrylamide, a carcinogen formed in heated foodstuffs.
AU Tareke, E.; Rydberg, P.; Karlsson, P.; Eriksson, S.; Tornqvist, M.
CS Correspondence (Reprint) address, M. Tornqvist, Dep. of Environmental